

REMARKS

Applicants respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. Claims 1-11 have been rejected. No claims have been amended. Accordingly, Claims 1-11 will be pending in the present application upon entry of this Reply and Amendment.

A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

35 U.S.C. § 101

On page 2 of the Office Action, Claims 1-8 and 10 were rejected under 35 U.S.C. § 101 as being related to non-statutory subject matter. The Examiner stated:

Claims 1-8 recite a method for determining the charge drawn by an energy storage battery. Since the “step of determining”, [sic] merely requires a person to think through the process without necessarily providing or using the result in a manner sufficiently related to the disclosed practical application so as to have an real-world value, the claims do not provide a useful concrete, and tangible result.

Regarding Claim 10, it is non- Statutory [sic] because it recites a computer program which is not a [sic] stored on a medium so as to realize its functionality.

The Applicants respectfully traverse the rejection of Claims 1-8 and 10.

It should be noted that the U.S. Patent and Trademark Office has recently published “Interim Guidelines for Examination of Patent Applications for Subject Matter Eligibility,” which is available at the following world wide web address (hereinafter referred to as the “Guidelines”):

http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf

The Guidelines clearly indicate that a claimed invention satisfies the criteria of 35 U.S.C. § 101 if it “produces a useful, concrete, and tangible result” (see page 19). With regard to the “usefulness” standard, the Guidelines indicate that the claimed invention must

be “specific, substantial, and credible.” The Applicants submit that the inventions claimed in Claims 1-8 and 10 satisfy the usefulness criteria. For example, as described in paragraph [0003] of the present Application,

During operation of batteries (e.g., lead-acid energy storage batteries for use in vehicle starting, lighting, and ignition applications) it is advantageous to determine the instantaneous state of the energy storage battery and to predict a future state with assumed environmental and battery state conditions. In this case, it is also desirable to determine the charge which is drawn in the charging mode.

Claim 1, which recites a step of “determining the charge drawn by an energy storage battery” and Claim 10, which also recites a step of “determining the charge drawn by an energy storage battery,” each produce a useful result – that is, the charge drawn by an energy storage battery.

With regard to the “tangible” aspect, the Guidelines indicate that the opposite meaning of “tangible” is “abstract.” Clearly, the inventions recited in Claims 1 and 10 produce a tangible result – the charge drawn by an energy storage battery. There is nothing abstract about such a result.

Finally, with respect to the “concrete result” required, the Guidelines note that “the process must have a result that can be substantially repeatable or the process must substantially produce the same result again.” The inventions recited in Claims 1 and 10 produce repeatable results – the determination of an energy storage battery that is performed in accordance with the methods recited in such claims would be expected to obtain the same result if repeated.

Also, with regard to the Examiner’s indication that Claim 10 does not satisfy 35 U.S.C. § 101 because “it recites a computer program which is not stored on a medium so as to realize its functionality,” the Applicants note that so long as the claimed invention produces a useful, concrete, and tangible result, there is no need for a “computer program” to be “stored on a medium” in order to satisfy 35 U.S.C. § 101.

The Applicants respectfully request withdrawal of the rejection of Claims 1-8 and 10 under 35 U.S.C. § 101.

Claim Rejections – 35 U.S.C. § 102

On page 3 of the Office Action, the Examiner rejected Claims 1-5 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application Publication No. 2002/0101243 to Mentgen et al.

Mentgen et al. is directed to a “Method and Device for Determining the Charge Status of a Battery” in that is described in paragraphs [0016]-[0018] as follows (with underlining added for emphasis:

[0015] Finally, in a step 105 an average is formed from the determined and calculated charge status values soc_{U0} and soc_i to obtain an average charge status soc .

[0016] Weighting for the averaging of step 105 is preferably performed on the basis of an equation of the form:

$$soc = (1 - gew) * soc_i + gew * soc_{U0} \text{ where } 0 \leq gew \leq 1.$$

[0017] Weighting factor gew is selected as a function of an accuracy, in particular a known or estimated accuracy, of open-circuit voltage U_R thus determined, which in turn depends on duration t_R of the resting phase. It has proven to be expedient to select a weighting factor gew according to an equation of the form:

$$gew = 1 - \exp(-t_R / T_R).$$

[0018] Value T_R corresponds to the time constant of the transient response of no-load voltage U_0 until it reaches open-circuit voltage U_R which depends on the battery temperature and its history. For example, if values of $soc_i = 0.8$ and $soc_{U0} = 0.6$ are determined, and if a resting phase $t_R = 0.5 T_R$ is assumed, this yields a weighting factor of 0.39, from which it is possible to calculate the battery charge status as follows:

$$soc = 0.61 * 0.8 + 0.39 * 0.6 = 0.722.$$

Claim 1 is in independent form and recites a “method for determining the charge drawn by an energy storage battery” comprising “determining the charge drawn as a function of an exponential function with a time constant, wherein the time constant is defined at least as a function of the energy storage battery type and of the temperature of at least one of the battery temperature and the electrolyte temperature” (emphasis added). Claims 2-5 depend from independent Claim 1.

Mentgen et al. does not identically disclose a “method for determining the charge drawn by an energy storage battery” that utilizes a time constant that is defined using the energy storage battery type” as recited in independent Claim 1. As described in the present application at paragraphs [0021] and [0037] with respect to an exemplary embodiment (underlining added for emphasis):

[0021] The time constant can thus be determined by three factors that are multiplied by one another, with the first factor being determined using a function which is dependent on the energy storage battery type and on the charging voltage or on the mean charging voltage or on the rated charging voltage. The second factor is calculated using a function which is dependent on the state of charge at the start of the drawing of the charge. The third factor is calculated using a function which is dependent on the battery or electrolyte temperature.

[0037] The time constant τ can thus be determined using the relationship:

$$\tau \approx R_{i0}(\text{energy storage battery type}, U_L) \cdot \tau_{Qs}/Q_0 \cdot \tau_T = \tau_{RT0}(\text{energy storage battery type}, U_L) \cdot f(Q_s/Q_u) \cdot f(T_e)$$

where τ_{RT0} is a time constant at room temperature, which is dependent only on the energy storage battery type and on the charging voltage U_L . This component τ_{RT0} of a time constant τ can be determined experimentally for energy storage batteries of one type and for vehicles from one manufacturer with respect to the normal charging voltage U_L , so that only a temperature measurement is required in order to determine the charge that is drawn.

Accordingly, Claim 1 is patentable over Mentgen et al. since Mentgen et al. does not disclose at least one element recited in Claim 1. Dependent Claims 2-5, which depend from

independent Claim 1, are also patentable. See 35 U.S.C. § 112 ¶ 4. The Applicants also note that Claims 6-8, which have been rejected only under 35 U.S.C. § 101, are also patentable at least for the same reasons as Claim 1.

The Applicants respectfully request withdrawal of the rejection of Claims 1-5 under 35 U.S.C. § 102(b).

Claim Rejections – 35 U.S.C. § 103

1. Mentgen et al. in view of Okada et al.

On page 4 of the Office Action, the Examiner rejected Claim 9 as being unpatentable over Mentgen et al. in view of U.S. Patent No. 5,949,217 to Okada et al. under 35 U.S.C. § 103(a).

The Examiner stated that:

Regarding Claim 9, Mentgen et al. disclose in Figures 1 and 2, a monitoring device for energy storage batteries comprising: a computation device (22) for determining the charge drawn by an energy storage battery starting from an initial state of charge at the start of the drawing of the charge (Page 2, Paragraph 0022); wherein the computation device is desired to carry out a method comprising: a method comprising determining the charge drawn by an energy storage battery starting from an initial state of charge at the start of the drawing of the charge (Paragraph 9 charging or discharging), the method comprising: determining the charge drawn as a function of an exponential function (Page 1, lines 1-25) with a time constant, wherein the time constant is defined at least as a function of the energy storage battery type and of the temperature of at least one of the battery temperature and the electrolyte temperature (Paragraph 18).

However, the Examiner acknowledged that Mentgen et al. does not disclose “a device for measuring battery temperature.”

The Examiner stated that Okada et al. discloses “in Figure 1, a device for measuring battery temperature (Column 3, lines 5-9)” and concluded that it “would have been obvious at

the time of the invention to a person having ordinary skill in the art to add a temperature measuring means in Mentgen et al. device in order to avoid battery overheating.”

Mentgen et al. is described above. Okada et al. is directed to a “Method to Determine Remaining Capacity of a Rechargeable Battery” and discloses a “computation circuit” that computes rechargeable battery discharge capacity” (col. 3, lines 18-31).

Claim 9 is in independent form and recites a “monitoring device for energy storage batteries” comprising, in combination with other elements, “computation device” that is “designed to carry out a method comprising: determining the charge drawn as a function of an exponential function with a time constant, wherein the time constant is defined at least as a function of the energy storage battery type and of the temperature of at least one of the battery temperature and the electrolyte temperature.”

The “monitoring device” recited in independent Claim 9 would not have been obvious in view of Mentgen et al., alone or in any proper combination with Okada et al. under 35 U.S.C. § 103(a). Mentgen et al. alone or in any proper combination with Okada et al. does not disclose, teach or suggest a “computation device” that is “designed to carry out a method comprising: determining the charge drawn as a function of an exponential function with a time constant, wherein the time constant is defined at least as a function of the energy storage battery type and of the temperature of at least one of the battery temperature and the electrolyte temperature.”

To transform the subject matter disclosed in Mentgen et al. and Okada et al. into a “monitoring device” (as recited in Claim 9) would require still further modification, and such modification is taught only by the Applicants’ own disclosure. The suggestion to make the combination of Mentgen et al. and Okada et al. has been taken from the Applicants’ own specification (using hindsight), which is improper.

The “monitoring device” recited in independent Claim 9, considered as a whole, would not have been obvious in view of Mentgen et al. and/or Okada et al.. The rejection of Claim 9 over Mentgen et al. in view of Okada et al. under 35 U.S.C. § 103(a) is improper. Therefore, Claim 9 is patentable over Mentgen et al. in view of Okada et al..

The Applicants respectfully request withdrawal of the rejection of Claim 9 under 35 U.S.C. § 103(a).

2. Mentgen et al. in view of Hirzel

On page 5 of the Office Action the Examiner rejected Claims 10-11 as being unpatentable over Mentgen et al. in view of U.S. Patent No. 5,381,096 to Hirzel under 35 U.S.C. § 103(a).

The Examiner stated that:

Regarding Claim 10, Mentgen et al. disclose in Figure 1, determining the charge drawn by an energy storage battery starting from an initial state of charge at the start of the drawing of the charge (Paragraph 9, charging or discharging), the method comprising: determining the charge drawn as a function of an exponential function (Page 1, lines 1-25) with a time constant, wherein the time constant is defined at least as a function of the energy storage battery type and of the temperature of at least one of the battery temperature and the electrolyte temperature (Page 2, Paragraph 18).

However, the Examiner acknowledged that Mentgen et al. does not disclose “a computer program code designed to carry out a method when the computer program is run using a processor device.” The Examiner stated:

Hirzel discloses in Figure 8, a computer program code designed to carry out a method when the computer program is run using a processor device (Column 3, lines 46-49, Column 10, lines 31- 41).

The Examiner concluded:

It would have been obvious at the time of the invention to a person having ordinary skill in the art to modify Mentgen et al. device and use a computer program in order to accurately calculates the state of charge of the battery.

Mentgen et al. is described above. Hirzel is directed to a “Method and Apparatus for Measuring the State-of-Charge of a Battery System” and discloses the use of a “simplified circuit model equivalent of a storage battery” that includes “as components a parallel

capacitor 12 and resistor 14, in series configuration with a second large capacitor” (column 4, lines 19-22).

Claim 10 is in independent form and recites a “computer program” that comprises, among other elements, “computer program code” that is “designed to carry out a method . . . comprising: determining the charge drawn by an energy storage battery as a function of an exponential function with a time constant, wherein the time constant is defined at least as a function of the energy storage battery type and of the temperature of at least one of the battery temperature and the electrolyte temperature”. Claims 11 depends from independent Claim 10.

The “computer program” recited in independent Claim 10 would not have been obvious in view of Mentgen et al., alone or in any proper combination with Hirzel under 35 U.S.C. § 103(a). Mentgen et al. alone or in any proper combination with Hirzel does not disclose, teach or suggest a “computer program code” that is “designed to carry out a method” that includes “determining the charge drawn by an energy storage battery as a function of an exponential function with a time constant, wherein the time constant is defined at least as a function of the energy storage battery type”.

To transform the subject matter disclosed in Mentgen et al. and Hirzel into a “computer program” (as recited in Claim 10) would require still further modification, and such modification is taught only by the Applicants’ own disclosure. The suggestion to make the combination of Mentgen et al. and Hirzel has been taken from the Applicants’ own specification (using hindsight), which is improper.

The “computer program” recited in independent Claim 10, considered as a whole, would not have been obvious in view of Mentgen et al. and/or Hirzel. The rejection of Claim 10 over Mentgen et al. in view of Hirzel under 35 U.S.C. § 103(a) is improper. Therefore, Claim 10 is patentable over Mentgen et al. in view of Hirzel.

Dependent Claim 11, which depends from independent Claim 10, is also patentable. See 35 U.S.C. § 112 ¶ 4.

The Applicants respectfully request withdrawal of the rejection of Claims 10-11 under 35 U.S.C. § 103(a).

* * *


It is submitted that each outstanding objection and rejection to the Application has been overcome, and that the Application is in a condition for allowance. Claims 1-11 will be pending in this Application. The Applicants request consideration and allowance of all pending Claims 1-11.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 06-1447. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1447. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 06-1447.

Respectfully submitted,

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